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THE WORK OF THE SAN ANTONIO EXPERIMENT FARM IN 1913.

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INTRODUCTION.

The work of the San Antonio Experiment Farm in 1913 was continued along the same general lines as described in the report for 1912.[1] The more important experiments were those in crop rotation and tillage; breeding and variety testing of cotton and of corn; rate of seeding and variety testing of sorghum; testing of varieties of peaches, plums, apricots, persimmons, grapes, walnuts, almonds, Chinese dates, and some other fruits of lesser importance; and testing of resistant stocks for these fruits. Additions were also made to the ornamental plantings.

With the exception of fruit and cotton the crop yields in 1913 were unusually heavy. The corn yield was the largest obtained during the seven years that the experiment farm has been operated. The yields of forage from both oats and sorghum were the heaviest so far obtained with the exception of those secured in 1908. The average yield of milo exceeded that of 1912 by 7.7 bushels per acre and was the largest so far obtained. The yields of milo have been extremely satisfactory and show conclusively that this crop is the most profitable grain crop for the San Antonio region. In the rate-of-seeding test with milo it was found that with relatively close spacing of the plants in the row the crop matured more uniformly and higher yields were obtained, chiefly because of earlier maturity and consequent escape from the ravages of the sorghum midge, which has been the principal menace to the production of grain sorghum in this region.

The effect of crop rotation and various tillage methods is becoming more noticeable. Summer fallowing and subsoiling have uniformly failed to justify the operations. Conclusions that have been drawn

[1] Hastings, S. H. The work of the San Antonio Experiment Farm in 1912. *In* U. S. Dept. of Agriculture, Bureau of Plant Industry Circular 120, 1913.

from these experiments have led to the incorporation of several new rotations, which may be expected to give additional information as to the best practices for the region.

There was a very light fruit crop in 1913, owing to late spring frosts. Only two plum varieties fruited and even the best peach varieties fruited but sparingly, while the others set no fruit. A heavy crop of fruit was obtained from the pomegranate varieties, and one variety of citrange, the Rusk, fruited this season for the first time.

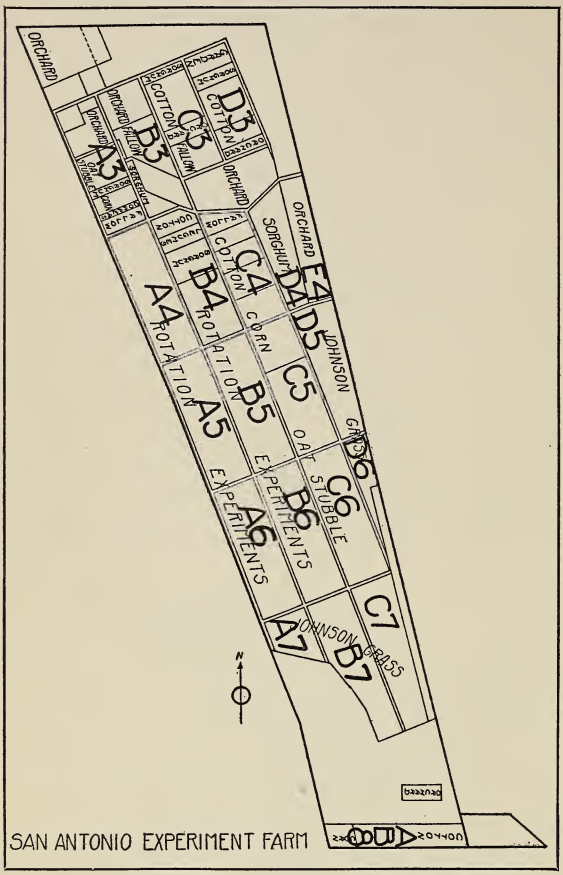

FIG. 1.—Diagram of the San Antonio Experiment Farm, showing the arrangement of the fields and the location of the experiments in 1913.

The work carried on by the Office of Acclimatization and Adaptation of Crop Plants has shown that a closer planting of cotton in the row than has been the practice gives higher yields. In the variety test of short-staple cottons, a locally selected Triumph stock gave the highest yield. The arrangement of the fields and the location of the experiments in 1913 are shown in figure 1.

CLIMATIC CONDITIONS.

The season of 1913 was generally favorable to crop production in the San Antonio region of Texas. More than the usual rainfall in December, 1912, put the soil in good condition to receive the January and February rains, which were practically normal in quantity. At planting time the soil was in excellent condition, and rapid and uniform germination and an excellent stand of nearly all

crops resulted. The distribution of the spring rainfall was favorable to the development of plant growth, and the heavy precipitation in June resulted in high yields of corn and forage crops. At the same time the abundance of moisture caused an excessive vegetative growth of cotton and favored the development of the cotton boll weevil to such an extent that the weevil damage at the experiment farm was much greater than it had been for several years past. A drought lasting through July and the greater part of August and the unusual abundance of boll weevils combined to lessen the cotton crop very materially.

During the months of September and October unusually heavy rains fell, causing serious floods in the San Antonio and adjacent rivers. Such rains were favorable to the development of late forage crops, and abundant feed was made from the second-crop growth of sorghum and Johnson grass. The remainder of the year was characterized by heavy rains, which caused much delay in fall work throughout the section, and in some parts of Texas disastrous floods occurred.

During the year the total precipitation at the experiment farm was 36.71 inches. This was 12.05 inches above the average for the seven years 1907 to 1913, inclusive, and about 10 inches above the normal for a 20-year period, as reported by the United States Weather Bureau station at San Antonio.

Owing perhaps to the excessive precipitation, the evaporation at the experiment farm was somewhat less than during any year of the last six. The total evaporation for 1913 was 58.68 inches, while the average for the years 1907 to 1913, inclusive, is 65.88 inches.

The temperature in the spring of 1913 was unusually low, the last killing frost occurring on March 17. The latest frost in spring during the preceding six years was on February 27, which occurred in 1912. This late frost in 1913 resulted in freezing the corn, which was about 2 inches high. New growth started up, however, so that replanting was not necessary. This frost also killed practically the entire fruit crop in the San Antonio region.

The first killing frost in autumn came on October 27, when a minimum temperature of 29° F. was recorded. This resulted in killing to the ground all the tender crops.

The meteorological observations made at the experiment farm are carried on in cooperation with the Biophysical Laboratory of the Bureau of Plant Industry. Table I gives a summary of these observations for 1913, together with the means for the 7-year period from 1907 to 1913, inclusive.

TABLE I.—*Summary of meteorological observations made at the San Antonio Experiment Farm, 1907 to 1913, inclusive.*

PRECIPITATION (INCHES).

Item.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Average for 7 years, 1907 to 1913	0.61	2.19	1.81	2.92	2.43	1.65	1.41	1.57	2.01	3.12	2.72	2.22	24.66
For 1913	1.01	1.95	2.74	1.32	2.23	3.89	.65	1.21	7.21	6.26	3.96	4.28	36.71

EVAPORATION (INCHES).

Average for 7 years, 1907 to 1913	2.63	2.99	4.57	5.44	6.82	8.14	8.65	9.18	6.97	5.10	3.08	2.31	65.88
For 1913	2.10	2.21	3.92	6.17	7.93	6.61	8.44	7.90	4.90	4.31	2.27	1.92	58.68

DAILY WIND VELOCITY (MILES PER HOUR).

Highest:													
1911–1913	10.4	15.9	9.1	10.6	9.2	11.9	12.1	12.1	6.6	8.5	9.5	8.0	15.9
For 1913	6.8	6.36	9.1	9.9	8.5	6.4	8.8	5.1	5.0	4.3	4.5	5.5	9.9
Lowest:													
1911–1913	.8	.6	.9	.4	1.1	1.4	.8	1.3	.5	.5	.4	.8	.4
For 1913	1.0	1.1	1.2	.4	1.1	1.9	.8	1.3	.5	.5	.4	.7	.4
Average:													
1911–1913	4.0	4.8	4.2	4.1	4.2	4.2	4.8	3.9	3.3	3.2	2.8	2.76	3.86
For 1913	3.1	3.5	3.9	3.6	3.9	3.3	3.1	2.4	2.1	2.1	2.5	2.12	2.97

TEMPERATURE (°F.).

Absolute maximum:													
7 years, 1907–1913	88.5	87	95	102	103	108	108	105	104	98	86.5	82	108
For 1913	75	86	90	93	96	96.5	102	101	101	91	83.5	79	102
Absolute minimum:													
7 years, 1907–1913	12	13	26	36	39	56	64	41	29	15	17	17	12
For 1913	20	28	26	36	54	63	65	64	46	29	34	27	20
Mean:													
7 years, 1907–1913	53.5	54.1	64	68.3	75.2	82.3	85	85.1	79.6	69.3	60.5	50.4	68.9
For 1913	49.8	50	57.7	66	75.2	79.7	83.7	84.1	75.5	67.3	65.8	51.5	67.2

KILLING FROSTS.

Year.	Last in spring.		First in autumn.		Frost-free period.
	Date.	Minimum temperature.	Date.	Minimum temperature.	
		°F.		°F.	Days.
1907	Feb. 8	29	Nov. 12	32	277
1908	Feb. 20	24	Nov. 14	29	268
1909	Feb. 25	30	Dec. 6	31	284
1910	...do.....	26	Oct. 29	32	246
1911	...do.....	29	Nov. 13	31	261
1912	Feb. 27	30.5	Nov. 2	29.5	245
1913	Mar. 17	26	Oct. 27	29	224

ROTATION AND TILLAGE EXPERIMENTS.[1]

The rotation and tillage experiments were continued along the same lines as outlined in the report for 1912. The crop season of 1913 completed the fifth year of these experiments. The results so far obtained warranted the adding of four new rotations at the opening of the present season. Two 4-year rotations and two 3-year rotations were added to those already under trial, so that at the present time the work occupies 98 quarter-acre plats. There is now a total of 35 different rotations of varying lengths, and there are 14 plats continuously cropped to the same crops.

The favorable results obtained with Dwarf milo in the rotation experiments in the season of 1912, when it was substituted for corn in five rotations and for the first time grown in these experiments, made it desirable to reduce still further the number of plats of corn. In 1913, Dwarf milo was therefore substituted for corn in five of the old rotations and included in the four new rotations. The results obtained from this crop in 1913 were very satisfactory. During the year, which was an unusually favorable one for Indian corn in the San Antonio region, the average yield from 14 plats of Dwarf milo was 47.7 bushels per acre, as compared with 34.9 bushels of corn per acre, an average from 21 plats. In reality the milo was at a much greater disadvantage than corn, for the rains occurring after June 15 came as the corn was beginning to tassel and when the crop was feeling the effects of the lack of moisture. If these rains had not occurred, there probably would have been an extremely poor yield of corn. On the other hand, the milo was practically mature by June 15, so that the rains occurring thereafter, and which insured the corn crop, were of little, if any, benefit to the milo crop.

Four years' experience has demonstrated the undesirability of growing cowpeas as a summer crop after oats or corn, on account of summer drought. At the beginning of the season of 1913, therefore, cowpeas as a catch crop after oats or corn were eliminated from all but two rotations in which cowpeas had previously been planted after oats. During the five years the rotation work has been conducted in its present form there has never been a season when cowpeas made a crop when planted after corn, and only one, 1913, when they made sufficient growth to be of any value as a green-manure crop when planted after oats. During most summers the soil has been so dry as to make useless the planting of cowpeas after corn, and the same has been true of cowpeas after oats during three of the five years. Figure 2 shows the growth of cowpeas after oats during the season of 1912. During 1913, cowpeas planted after oats made excellent growth, but the season was a most unusual one, the pre-

[1] These experiments are under the direct supervision of Mr. C. R. Letteer, assistant.

cipitation during September and October being 13.47 inches, which is much above the normal for those months. There was sufficient moisture at planting time, about July 1, to insure perfect germination. The plants made some growth and then remained practically the same size until heavy rains came in September.

Field peas [1] have been grown at the experiment farm during five years, and very favorable results have been obtained.[2] The abundant growth of green material indicated that this pea would make a desirable green-manure crop. Previous to 1913 no trials were made with this legume as a green-manure crop. In the fall of 1912 field peas as a winter cover and green-manure crop were introduced in two rotations, and two plats were planted to peas on October 31, 1912. An

FIG. 2.—Plat of cowpeas in rotation experiments, 103 days after planting, at the San Antonio Experiment Farm, showing the small growth made during the dry weather of summer. Photographed October 8, 1912. (Compare with figure 3.)

excellent growth of green material was made before the peas were plowed under the following spring. Figure 3 shows the appearance of the peas at the time of plowing under. The excellent results obtained with this crop during 1913 and previously have shown that field peas appear to be the most satisfactory legume that can be grown as a catch crop in the San Antonio region. How valuable a green-manure crop this legume will prove to be remains to be determined, but there seems to be no question about its ability to produce a heavy growth. At the present time the peas are under trial as a green-manure crop in five rotations and are being grown during the winter on one plat which is cropped annually to cotton.

[1] These are frequently known as Canada field peas.

[2] See "Forage-crop experiments at the San Antonio Field Station," U. S. Dept. of Agriculture, Bureau of Plant Industry Circular 106, 1913.

The favorable results obtained with Sudan grass during 1911 and 1912 made it desirable to introduce this crop into the rotation experiments. Accordingly, this crop was introduced into a 3-year rotation made up of Dwarf milo, Sudan grass, and cotton. The Sudan grass occupies the same relative position as oats in similar rotations. The yield from the one plat of Sudan grass in 1913 was at the rate of 5.3 tons per acre.

The results obtained from the rotation experiments during the season were very satisfactory and the yields of most crops were high. Table II indicates the crops grown in these experiments, the number of plats planted to each crop in 1913, the average yields per acre, and the highest and lowest yields per acre in 1913, as well as the average yields of the various crops from 1909 to 1912, inclusive.

FIG. 3.—Plat of Golden Vine field peas in rotation experiments at the San Antonio Experiment Farm. These peas were planted on October 31, 1912, and photographed on February 25, 1913. About 15 tons of green material per acre were produced and plowed under for green manure. (Compare with figure 2.)

TABLE II.—*Average yields per acre of crops in the rotation experiments in 1913 and from 1909 to 1912, inclusive, at the San Antonio Experiment Farm.*

Crop.	Average yield, 1909–1912.	Number of plats in 1913.	Yield in 1913.		
			Highest.	Lowest.	Average.
Corn.....bushels..	15.6	21	40.3	26.9	34.9
Dwarf milo.....do....	[1] 40.0	14	57.3	36.2	47.7
Oats, grain.....do....	11.7	7	38.0	6.3	13.4
Cotton.....pounds..	528.7	30	760.0	350.0	560.1
Sorghum:					
4.1-foot drills.....tons..	3.05	5	7.78	4.5	6.69
8-inch drills.....do....	2.71	6	7.35	4.0	6.21
Oats, hay.....do....	1.33	7	3.57	2.29	2.86

[1] 1912 only.

The different rotations have not been under trial a sufficient length of time to determine which are best and the best sequence for the various crops grown in the region. However, the results so far obtained show the decided superiority of crop rotation as compared with 1-crop systems. It has been the practice in the rotation experiments to have one or more plats on which each crop is grown continuously with which to compare the yields from the same crop grown in various rotations. The yields have been uniformly higher when the crops have been grown in rotation than when the crops were grown continuously on the same land.

SUBSOILING.

The results obtained from subsoiling were corroborative of results previously published.[1]

The average yields of corn and cotton from land subsoiled and from land not subsoiled were practically the same, and subsoiling decreased the yield of oats for both hay and grain.

FALLOWING.

The results of fallowing were substantially the same as in previous years. The yields of corn, cotton, and oats grown on fallowed land, together with the average yield of each crop from all of the rotation experiments, are shown in Table III.

TABLE III.— *Yields of crops grown on fallowed land and average yields of all rotation plats at the San Antonio Experiment Farm in 1913.*

Crop.	Average of all plats in rotation.		Summer fallowed.	
	Number of plats.	Yield.	Number of plats.	Yield.
Oats (yield in bushels)	7	13.4	1	38.0
Corn (yield in bushels)	21	34.9	1	30.7
Cotton (yield in pounds of seed and fiber)	30	560.1	1	350.0

It is seen from the table that fallowing was favorable to the production of winter oats grown for grain, but that the yields of corn and cotton were much lower than the average yields obtained in the rotations. The increased yield of oats on fallowed land appears to be due to slower growth during the early part of the season and to the consequent lessened damage from lodging or from late drought. Oats on the other plats made such a luxuriant vegetative growth during the early part of the season that they lodged badly and the

[1] Experiments in subsoiling at San Antonio. *In* U. S. Dept. of Agriculture, Bureau of Plant Industry Circular 114, 1913.

The work of the San Antonio Experiment Farm in 1912. *In* U. S. Dept. of Agriculture, Bureau of Plant Industry Circular 120, 1913.

quantity of water available during the latter part of the growing period was not sufficient to mature the plants properly. It was observed that fallowing did not make the conditions more favorable for plant growth throughout the season as a whole, but that it was the depressing effect on the vegetative growth early in the season which resulted in a higher yield of grain.

HORTICULTURAL WORK.

Owing to late spring frosts which were preceded by warm weather, there was practically no fruit crop. Only a few peaches were found on the trees of the Mexican seedling peach orchard, and the same was true of the other peach varieties. Only two varieties of plums,

FIG. 4.—San Pipetos pomegranates in the orchard at the San Antonio Experiment Farm, May 9, 1913.

the Gonzales and Terrell, bore fruit. The former set a heavy crop. The Gonzales plum is undoubtedly the most reliable variety that has been under trial. The Rusk citrange fruited for the first time in 1913. The citrange is one of the hardiest of the citrus fruits, and this variety is particularly well adapted to San Antonio conditions.

POMEGRANATES.

A heavy crop was matured in 1913 from most of the pomegranate varieties that have fruited. The San Pipetos, De Jative, and Dessia varieties have produced the best fruits of the collection of nine varieties. The Papershell and Subacid varieties have matured the heaviest crops. Where strong, vigorous plants are desired, the San Pipetos and De Jative should be planted (fig. 4).

RESISTANT STOCKS.

The resistance or nonresistance of the various stocks to the adverse soil conditions was more pronounced in 1913 than ever before. The testing of the various resistant varieties as stocks is to be continued, for it is evident that there is great variation in the different fruits and varieties of the same species as to their resistance to disease. A collection of five different lots of peach seedlings was made during the year, and these are to be tested in an orchard devoted to resistant stocks.

The fruit stocks that are receiving special attention are peaches, grapes, walnuts, plums, persimmons, and pears. The results obtained

FIG. 5.—View of ornamental plantings at the San Antonio Experiment Farm, showing palms, yuccas, bamboos, and other semitropical plants. About 150 different species are being tested.

along this line indicate that by the use of proper stocks many fruits heretofore considered not adapted to local conditions may be produced and also that many new fruits may be added to the list.

ORNAMENTALS.

The testing of ornamental trees and shrubs suitable for the San Antonio region is receiving much attention, and many of the plantings have reached the stage where their adaptability to the local conditions can be determined. There are under trial at present 149 different species, as follows: Miscellaneous species which were secured largely from various nurseries, 65; importations of the Office of Foreign Seed and Plant Introduction, 30 species; yuccas, agaves, etc., most of which are native, 19 species; palms, 19 species; and native species, most of which may be used as ornamentals, 16. In addition to the above there are under trial 86 varieties of roses. A view of a part of the ornamental plantings is shown in figure 5.

SPACING OF COTTON PLANTS.

During the past two years extensive experiments have been carried on with cotton planted in rows different distances apart and with the plants thinned to varying distances in the row. Tests are also being made with cotton thinned at various stages of growth. The object of these experiments has been to test the possibility of securing earlier crops by controlling the formation of the vegetative branches. It has been found that the vegetative branches can be suppressed by thinning the cotton later and leaving the plants closer together in the rows than has been customary. This work is carried on by the Office of Acclimatization and Adaptation of Crop Plants. Recent publications by O. F. Cook[1] give the results of these experiments carried on in 1912 and 1913. In these publications it is shown that closer planting than is customary gives higher yields. Closer spacing of the plants in the row has been adopted in the field plantings at the station, with results which seem to justify the more extensive use of this method in the section. The distance apart which the plants have heretofore been spaced was 24 inches, but this distance has been reduced to 12 inches or less.

Mr. R. M. Meade, of the Office of Acclimatization and Adaptation of Crop Plants, has furnished some figures on the results of some experiments carried on at the San Antonio Experiment Farm to determine the most desirable distances to which to thin the plants in the row. These figures are given in Table IV.

TABLE IV.— *Yields of cotton in 1912 and 1913 with plants spaced different distances apart at the San Antonio Experiment Farm.*

Year.	Yield of seed cotton per acre (pounds).			Increase.
	Plants 2 feet apart.	Plants less than 1 foot apart.	Difference.	
				Per cent.
1912 (dry land)	410	633	223	54.4
1912 (irrigated)	1,084	1,281	197	18.2
1913 (dry land)	439	501	62	14.0
Average	644	805	161	28.9

Cotton grown according to this new system, or where the plants are spaced closer together, grows in a hedgelike form and may be more readily picked, either by hand or by machinery. One feature that makes this new system especially adapted to the San Antonio

[1] A new system of cotton culture. *In* U. S. Dept. of Agriculture, Bureau of Plant Industry Circular 115, 1913. A new system of cotton culture and its application. U. S. Dept. of Agriculture, Farmers' Bulletin 601, 1914.

region, where the growing period is frequently shortened by drought or by the boll weevil, is the fact that a crop may be matured earlier than where the plants are spaced at greater distances.

VARIETY TEST OF COTTON.

A variety test of cotton, which was practically a duplicate of the test made in 1912, was conducted in 1913. Table V gives the results of this test. The varieties were planted in rows 16 rods long.

TABLE V.—*Results of variety tests of short-staple cotton at the San Antonio Experiment Farm in 1913.*

Relative position.		Variety.	Stand.		Yield per acre (pounds).	
1912	1913		Plants per row.	Per cent.	Seed cotton.	Lint.
2	1	S. A. 1000, Triumph	163	100	544	169
3	2	S. A. 920, Triumph	150	92	496	154
	3	S. A. 917, Triumph	143	88	496	166
6	4	Rowden	140	86	492	132
3	5	Roundnose	147	90	480	127
	6	Trook	149	91	464	130
5	7	Lone Star	147	90	432	140
	8	Boudurant	148	91	416	106
	9	Triumph, San Saba	149	91	408	120
	10	Lanquin	150	92	392	131
11	11	Acala	159	97	348	104
8	12	Durango	162	99	336	96

As shown in Table V, the San Antonio selections of the Triumph variety ranked high during both years. Considering both yield and quality, the Triumph is the most desirable variety tested during the past two years. The Virgatus gave the highest yield in 1912, but the lint produced is very short, and consequently the variety was not included in the test in 1913.

A test of 10 varieties of long-staple Upland cotton was made in cooperation with the Office of Acclimatization and Adaptation of Crop Plants. These varieties were planted on field D3, and it was intended that they should be grown under irrigation. They received a light irrigation soon after planting, but owing to the heavy spring rains it was not necessary to irrigate again until late in the season. But at this time the boll weevils appeared in such numbers that it was not deemed advisable to stimulate an excessive vegetative growth, so that no further irrigating was done. Table VI gives the results of the test.

TABLE VI.—*Results of variety tests of long-staple Upland cotton at the San Antonio Experiment Farm in 1913.*

Variety.	Stand.	Yield per acre (pounds).		Value of lint.	
		Seed cotton.	Lint.	Per pound.	Per acre.
	Per cent.				
Hartsville	94	537.2	188	$0.15	$28.20
Columbia	98	468	126	.15	18.90
Durango	99	464	143	.15	21.45
Snowflake	99	432	130	.20	26.00
Blackseed	100	424	106	.20	21.20
Webbet LS	98	400	106	.14	14.84
Foster	91	397.2	115	.15	17.25
Maynard	98	378.8	99	.16	13.86
Webber 49	90	329.2	95	.14	13.30
Keenan	87	312	87	.14	12.18

The column headed "Value of lint per pound" is based on the ordinary short staple selling at 13 cents per pound. It should be understood that while these estimates are only relative they should not be ignored. It is clearly possible to produce long-staple cotton in this region whenever market conditions are such as to justify it, especially on land that can be irrigated when necessary in dry seasons. The best of the above varieties will be tested again in 1914.

GRAIN SORGHUMS.

In 1913 the work with grain sorghums consisted of a variety test of four varieties and of some plant-spacing experiments, both with the plants different distances apart in the rows and with the rows different distances apart.

VARIETY TEST.

Table VII gives the yields obtained in 1913 in the variety test with grain sorghums.

TABLE VII.—*Yields of grain-sorghum varieties at the San Antonio Experiment Farm in 1913.*

Variety.	Yield per acre.	Variety.	Yield per acre.
	Bushels.		*Bushels.*
Dwarf milo	46.2	Feterita (Sudan durra)	30.4
White milo	36.8	Dwarf kafir	27.7

Considerable interest is being shown in feterita as a substitute for milo or kafir. At the experiment farm it has not yielded as well as milo, although it has generally outyielded kafir. Table VIII gives the average yield of Dwarf milo and feterita for the years 1911 to 1913.

TABLE VIII.—*Average yields of Dwarf milo and feterita at the San Antonio Experiment Farm in 1911, 1912, and 1913.*

Year.	Yield per acre—	
	Dwarf milo.	Feterita.
	Bushels.	*Bushels.*
1911	32.0	25.3
1912	50.5	33.1
1913	46.4	24.4
Average	43.0	27.6

SPACING OF MILO.

The successful production of grain sorghum depends upon early maturity because of the ravages of the sorghum midge.[1] Milo tillers very freely at San Antonio, especially when the plants are spaced some distance apart. The tillers flower several days later than the main stalk, lengthening the season of the crop, and as the margin between the flowering of the plants and the emergence of the sorghum midge is frequently very short it is of importance that the crop be matured as uniformly and quickly as possible.

In 1913 ten plats of milo were devoted to a test to determine the effect upon the tillers of spacing the plants to various distances. It was found that the plants can be placed much closer together than is generally supposed without decreasing the yield. Where the plants were relatively close together in the row the number of tillers was very materially decreased. As the tillers are later in maturing than the main stalk, earlier and more uniform ripening was obtained with close spacing than where wide spacing was practiced. Table IX gives a summary of the results.

TABLE IX.—*Summary of results obtained with milo planted in rows different distances apart and with the plants spaced to varying distances within the row at the San Antonio Experiment Farm in 1913.*

Distances apart (inches).		Average number per plant.		Yield per acre.	Distances apart (inches).		Average number per plant.		Yield per acre.
Rows.	Plants.	Heads.	Tillers on May 15.		Rows.	Plants.	Heads.	Tillers on May 15.	
				Bushels.					*Bushels.*
48	(2)	1.3	1.9	46.4	48	18	5.2	5.7	42.5
48	2	1.5	1.8	46.4	44	5	2.8	4.7	45.3
48	5	2.6	4.0	46.2	40	5	2.2	2.9	45.8
48	8	3.6	4.5	43.8	36	5	2.5	4.0	42.9
48	12	4.3	5.3	42.1					

[1] See "Grain-sorghum production in the San Antonio region of Texas." U. S. Dept. of Agriculture, Bureau of Plant Industry Bulletin 237, 1912.

[2] Not thinned.

As shown in Table IX, varying the spacing had comparatively little effect on the yields, but the highest yields were obtained from relatively close spacing. The most important effect of spacing shown in the table was the decreased number of heads and of tillers per plant where the plants were relatively close together within the row. The benefit derived from having few tillers lies in the fact that few tillers favor early and uniform maturity. On June 28, when 90 per cent of the heads on the close-spaced plants (those left unthinned and those thinned to 2 inches) were ripe, less than 70 per cent of the heads on the wider spaced plants had reached maturity. Early and uniform maturity lessens the danger of damage by the sorghum midge, and the results obtained in 1913 strongly indicate that closer spacing than has usually been practiced will result in earlier and more uniform maturity.

VARIETY TEST OF CORN.

Four popular local varieties of corn were tested in comparison with two local unnamed varieties which are rather extensively grown. Table X gives the results of this test.

TABLE X.— *Yields of corn varieties at the San Antonio Experiment Farm in 1913.*

Variety.	Stand.	Yield per acre.	Variety.	Stand.	Yield per acre.
	Per cent.	*Bushels.*		*Per cent.*	*Bushels.*
Laguna	95.1	36.0	Evins	92.6	31.6
Ferguson's Yellow Dent	91.6	34.5	Surecropper	82.9	31.3
Chisholm	85.6	32.9	Lamm		21.3

The Laguna, a strain grown and selected at the experiment farm for five years, gave the highest yield. Conditions were somewhat more favorable for this variety than for the others, which are a little earlier in maturing. The earlier varieties were somewhat injured by the drought occurring early in June at the time these varieties had begun to tassel. The June rains came in time so that the Laguna variety was probably but little injured.

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